

**Remarks/Arguments**

Claims 1-3 and 5-36 are pending in the application. Claims 3, 6, 7, 9, 12, 15, 16, 18, 21-23, and 31-33 have been amended. Claims 19-20 have been cancelled. New claims 37-42 have been added.

**Telephone Interview Summary**

Applicant wishes to thank the Examiner for conducting the telephone interview of June 15, 2004. A complete and proper recordation of the substance of the telephone interview is provided, as follows:

- a) No exhibits were shown nor was any demonstration conducted.
- b) Claim 1 was discussed.
- c) The specific prior art that was discussed included unexamined patent application JP 11-310992, United States Patent 6,385,222 and United States Patent 5,515,682.
- d) No claim amendments of a substantive nature were proposed during the telephone interview.
- e) Applicant noted that JP 11-310992 is an unexamined patent application, and that no exclusionary rights had been awarded to the applicant as of the filing date of the instant application. In fact, patent number P3469833, which is based on unexamined patent application number JP 11-310992, was not registered until September 5, 2003, which is well after the June 20, 2001 filing date of the instant application. Accordingly, Applicant submitted that JP 11-310992 is not properly citable under 35 U.S.C. 102(e) against the instant application.

Applicant submitted that the information disclosure statements filed 12 December 2001 and 26 December 2001 were filed prior to the first office action on the merits and accordingly were filed in compliance with 37 CFR 1.97(b)(3), and do not require payment of the fee set forth in 37 CFR 1.17(p).

Applicant submitted that claims 1-3 and 5-36 are not incomplete under 35 USC 112 second paragraph, as the elements outlined at page 3 of the Office Action mailed on 3/17/2004 are not essential elements of the instant invention as claimed at claims 1-3 and 5-36.

Having regard to claim 1, Applicant submitted that no combination of Applicant's Admitted Prior Art (Figs. 6a-b) and Nagakubo et al. (5,515,682) teaches overcurrent or overvoltage limiting circuits. For instance, Nagakubo et al. is merely concerned with not heating or cooling proximate the zero point. Accordingly claim 1 is not obvious in view of Applicant's Admitted Prior Art (Figs. 6a-b) and Nagakubo et al.

Applicant submitted that the double patenting rejection of claims 1-3, 5-7, 9-11, 16-27, 29-32, 35, and 36 is not proper. For instance, claim 1 could be literally infringed without literally infringing a corresponding claim in the reference patent (6,385,222). For instance, a device according to claim 1 of the instant application having only an overvoltage limiting circuit but not an overcurrent limiting circuit would literally infringe claim 1 of the instant application but would not literally infringe any claim of the reference patent (6,385,222).

- f) Applicant suggested that, in order to respond more completely to the 35 USC 102(e) rejection that was raised in the Office Action mailed on 11/06/2002, Applicant would identify on the record the current inventorship on a claim by claim basis.
- g) The Examiner agreed that unexamined patent application JP 11-310992 is not citable against the instant application under 35 USC 102(e) and that, based on the date of registration of patent number P3469833, the issued Japanese patent also is not citable against the instant application under 35 USC 102(e).

The Examiner agreed to withdraw the 35 USC 112 second paragraph rejection of claims 1-3 and 5-36.

No agreement was reached concerning the 35 USC 103(a) rejection of claim 1 (Applicant's Admitted Prior Art (Figs. 6a-b) and Nagakubo et al.).

No agreement was reached concerning the double patenting rejection of claims 1-3, 5-7, 9-11, 16-27, 29-32, 35, and 36.

### **Amendments to the Claims**

Claim 3 has been amended in order to more clearly define that subject matter which Applicant regards as the invention. In particular, claim 3 has been amended as follows:

3. A semiconductor laser module as defined in Claim 4 2, wherein the thermo-module is configured to support the semiconductor laser element via solder, and comprising a reverse current flow prevention circuit for preventing current from flowing into said thermo module in a direction opposite to that of a drive current of said thermo module oriented for causing melting of the solder.

An example of support for the proposed amendment to claim 3 may be found in the application as originally filed at page 10, lines 8-22, and at page 10, line 31 to page 11, line 4. Accordingly, no new matter has been added in the proposed amendment.

Claim 6 has been amended to recite --...wherein the overcurrent limiting circuit is electrically coupled with the at least an element to divert current flowing thereto and oriented for causing heating of the semiconductor laser element --. An example of support for the proposed amendment to claim 6 may be found in the application as originally filed at page 8, lines 23-27. Accordingly, no new matter has been added in the proposed amendment.

Claim 7 has been amended to recite --...the flowing current is oriented in a direction for causing cooling of the semiconductor laser element thermo-module" As discussed at page 8, lines 23-27 of the application as originally filed, it is the semiconductor laser

element that is being cooled or heated by the thermo-module. Accordingly, no new matter has been added in the proposed amendment.

Claims 9 and 12 have been amended in a manner similar to that discussed having regard to claim 7, above.

Claim 12, which depends from claim 9, has been further amended. In particular, claim 12 has been amended to read "...wherein in use the bypass channel, ~~resistor~~ zener diode and diode provide an overcurrent limiting circuit..." The "resistor" at line 7 of claim 12 has no antecedent basis. Applicant respectfully submits that the "resistor" was inadvertently included instead of the "zener diode." An example of support for the proposed amendment may be found in the application as originally filed at page 15, lines 17-19 where it is disclosed "As indicated in Fig. 7a, a featured structure in this first embodiment is to employ an overcurrent limiting circuit 20 in the form of an overcurrent limiting means. The overcurrent limiting circuit 20 is in the form of a bypass path 21, a zener diode 22, and a diode 23." Accordingly, no new matter has been added in the proposed amendment.

Claims 15 and 16 have been amended in order to more clearly define the subject matter which applicant regards as the invention. No new matter has been added.

Claim 18, which depends from claim 16, has been amended. In particular, "an optical fiber" has been deleted from claim 18 since the dependency of claim 16 has been changed to depend from claim 2 instead of from claim 1. Claim 2 recites "...an optical fiber optically coupled for receiving laser light emitted from the semiconductor laser element." Claim 18 has been further amended in order to more clearly define the subject matter which applicant regards as the invention. Accordingly no new matter has been added.

Claims 21-23 have been amended in order to more clearly define the subject matter which applicant regards as the invention. No new matter has been added.

Claims 31-33 have been amended in order to more clearly define the subject matter which applicant regards as the invention. No new matter has been added.

New claims 37-42 have been added to the application.

An example of support for new claim 37 may be found at claim 25 as originally filed and at page 15, lines 17-19.

An example of support for new claim 38 may be found at page 10, lines 8-22.

An example of support for new claim 39 may be found at original claim 27.

An example of support for new claim 40 may be found at original claim 28.

An example of support for new claim 41 may be found at original claim 29.

An example of support for new claim 42 may be found at original claim 30.

### **Statement Regarding Inventorship**

Applicant wishes to state on the record that the sole inventor of the subject matter defined in claims 1-3, 5-11, 16-18, 21-27, 29-32, 36-39, and 41-42 appearing in the current listing of claims is Takeshi Aikiyo. The joint inventors of the subject matter of claims 12-15, 28, 33-35, and 40 are Takeshi Aikiyo, Takashi Koseki, and Chihomi Furuhashi.

Applicant intends to submit under separate cover a supplemental response, including a signed declaration under 37 C.F.R. 1.132, so to provide evidence supporting the above-outlined inventorship of the subject matter that is defined in each of the claims appearing in the current listing of claims.

Accordingly, Applicant wishes to state on the record that U.S. Patent No. 6,385,222 B1 is not properly citable against claims 1-3, 5-11, 16-18, 21-27, 29-32, 36-39, and 41-42 of the instant application, as the inventive entity of claims 1-3, 5-11, 16-18, 21-27, 29-32, 36-39, and 41-42 is identical to the inventive entity of U.S. Patent No. 6,385,222 B1. As such, having regard only to claims 1-3, 5-11, 16-18, 21-27, 29-32, 36-39, and 41-42, Applicant submits that U.S. Patent No. 6,385,222 B1 is **not by another**. Accordingly, Applicant

respectfully submits that claims 1-3, 5-11, 16-18, 21-27, 29-32, 36-39, and 41-42 are in proper form for allowance.

Applicant further submits that claim 12 does not include the limitation that the diode is a zener diode, as is implied at page 8, item 8 of the Official Action mailed on 11/06/2002. In fact, claim 12 (as currently amended) actually recites “**a zener diode disposed serially to the diode within the bypass channel and oriented opposite to the diode**” for providing an approximately fixed zener voltage when the flowing current is oriented in a direction for causing heating of the semiconductor laser element.” No modification of the teachings of Aikiyo (6,385,222) teaches all of the features in as complete detail as is recited at amended claim 12. Furthermore, Applicant wishes to invoke 35 U.S.C. 103(c). In particular, Aikiyo (6,385,222) is available as prior art only under 35 U.S.C. 102(e), and is not to be considered when determining whether an invention sought to be patented is obvious under 35 U.S.C. 103, since the subject matter of Aikiyo (6,385,222) and the invention as claimed at claims 12-15, 28, 33-35, and 40 were commonly owned or subject to an obligation of assignment to the same entity at the time of the invention. Accordingly, Applicant respectfully submits that claims 12-15, 28, 33-35, and 40 are in proper form for allowance.

### **Terminal Disclaimer**

Applicant wishes to thank the Examiner for indicating the acceptance of the terminal disclaimer filed on 18 November 2003.

### **Information Disclosure Statement**

As discussed during the telephone interview of June 15, 2004, the information disclosure statements filed 12 December 2001 and 26 December 2001 were filed prior to the mailing of the first office action on the merits, and accordingly were filed in compliance with 37 CFR 1.97(b)(3), and do not require payment of the fee set forth in 37 CFR 1.17(p). Applicant respectfully requests consideration of the information disclosure statements filed 12 December 2001 and 26 December 2001.

### **Claim Rejections – 35 USC § 112**

Claims 1-3 and 5-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention

The Examiner has agreed to withdraw the rejection of claims 1-3 and 5-36 under 35 U.S.C. 112, second paragraph. Accordingly, Applicant considers this amendment to be fully responsive to the rejection of claims 1-3 and 5-36 under 35 U.S.C. 112, second paragraph.

### **Claim Rejections – 35 USC § 102**

Claims 1-3, 5-11, 16-27, 29-32, 35, and 36 are rejected under 35 U.S.C. 102(e) as being barred by applicant's patent JP 11-310992 (application number).

As discussed during the telephone interview of June 15, 2004, JP 11-310992 is an unexamined patent application, and no exclusionary rights had been awarded to the applicant as of the filing date of the instant application. In fact, patent number P3469833, which is based on unexamined patent application number JP 11-310992, was not registered until September 5, 2003, well after the June 20, 2001 filing date of the instant application. Accordingly, Applicant submits that JP 11-310992 is not properly citable under 35 U.S.C. 102(e) against the instant application.

Applicant respectfully submits that claims 1-3, 5-11, 16-27, 29-32, 35, and 36 are in proper condition for allowance. Favorable reconsideration is kindly requested.

### **Claim Rejections – 35 USC § 103**

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art **Figs. 6a-b** in view of Curl (4999728).

Applicant respectfully traverses the rejection of claim 1 under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art **Figs. 6a-b** in view of Curl

(4999728). In particular, Applicant respectfully submits that the proposed combination does not teach, either explicitly or impliedly, each and every feature of the invention as claimed at claim 1. For instance, Applicant submits that the proposed combination results in a semiconductor laser element, a thermo-module for adjusting the temperature of the semiconductor laser element in dependence upon an amount of current flowing into said thermo-module, and *a surge protection circuit for disconnecting the thermo-module from a power source upon a power interruption, and when power is restored, for maintaining the thermo-module disconnected for a short delay until transients have substantially abated.* No combination teaches all of the features of the invention as claimed at claim 1, including “at least one of an overcurrent limiting circuit to suppress an overcurrent flowing into the thermo-module and an overcurrent limiting circuit to suppress application of an overvoltage across said thermo-module.” As is stated at page 10, lines 8-10, of the application as originally filed, “the overcurrent limiting circuit 20 is provided, by which a reverse overcurrent flow to the thermo-module 5 in the heating direction is **limited or at least reduced** over prior art circuit design.” Applicant respectfully submits that the *surge protection circuit* of Curl is not equivalent to the at least one of an overcurrent **limiting** circuit and an overcurrent **limiting** circuit as recited at claim 1. Accordingly, Applicant respectfully submits that claim 1 is in proper form for allowance.

Applicant further submits that the proposed combination is unmotivated. In particular, Curl teaches *a surge protection circuit for disconnecting a protected device from a power source upon a power interruption, and when power is restored, for maintaining the device disconnected for a short delay until transients in the line voltage have substantially abated.* One of skill in the art at the time of the invention would not have been motivated to make the proposed combination as outlined at page 10 of the Office Action mailed on 03/17/2004, since “the intensity and wavelength of laser light emitted from the semiconductor laser element 2 are known to fluctuate in response to the temperature of the semiconductor laser element 2 itself. Therefore, in order to maintain the intensity and wavelength of the laser light constant, the drive controller controls the direction of current flow within the thermo-module 5 and the amount of current flowing therein on the basis of an output value provided from the thermister 10, thereby controlling the heating action and

cooling action of the thermo-module 5. Through control by the thermo-module 5, the semiconductor laser element 2 is typically kept at an almost constant temperature, whereby the intensity and wavelength of the laser light emitted from the semiconductor laser element 2 is constant.” (see page 3, lines 4-12 of the application as originally filed). Clearly, the *surge protection circuit* disclosed by Curl would be unsuitable for use with a semiconductor laser module, since the *surge protection circuit* disclosed by Curl operates to disconnect the protected device (i.e. thermo-module) from a power source, and to maintain the protected device disconnected until transients in the line voltage have substantially abate. When the thermo-module is disconnected from the power source, no control of the temperature of the semiconductor laser element is possible, resulting in temperature fluctuations of the semiconductor laser element, which in turn causes the intensity and/or wavelength of laser light emitted from the semiconductor laser element to vary. One of skill in the art at the time of the invention would not have been motivated to make the proposed combination, since it is known to be very important to achieve stable intensity and wavelength of the laser light emitted from a semiconductor laser element. Accordingly, Applicant respectfully submits that claim 1 is in proper form for allowance.

Applicant further submits that more than mere experimentation would be required to modify the combined teachings of Applicant’s Admitted Prior Art **Figs. 6a-b** and Curl so as to teach every feature claimed at claim 1, and that any such modification would render the teaching of Curl unsuitable for its intended purpose. Accordingly, Applicant respectfully submits that claim 1 is in proper form for allowance.

Claim 1 is rejected under 35 U.S.C. 102(e) as being unpatentable over Applicant’s Admitted Prior Art **Figs. 6a-b** in view of Nagakubo et al. (5515682).

Applicant has assumed that the Examiner intended to reject claim 1 under 35 U.S.C. 103(a) as being unpatentable over Applicant’s Admitted Prior Art **Figs. 6a-b** in view of Nagakubo et al. (5515682). If this assumption is incorrect, Applicant respectfully requests further clarification.

Applicant respectfully traverses the rejection of claim 1 under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art **Figs. 6a-b** in view of Nagakubo et al. (5515682). In particular, the combination of the Applicant's Admitted Prior Art and Nagakubo fail to describe a system that provides the advantages of the system described with reference to claim 1. Specifically, claim 1 states:

“...at least one of an overcurrent limiting circuit to suppress an overcurrent flowing into the thermo-module and an overvoltage limiting circuit to suppress application of an overvoltage across said thermo-module.”

As is discussed in the attached declaration, the overcurrent protection circuit of Nagakubo serves to scale down currents provided to a Peltier device during normal operation of the circuit of Nagakubo (ref Fig. 4 of Nagakubo); however, the circuit is not limiting in nature. A limiting circuit would act to cap the amount of current flowing as opposed to simply scaling said current. The prior art circuit is not likely to protect the Peltier element from externally provided electrical signals or those resulting from circuit faults having high voltage and current. In the case of a circuit according to Nagakubo, if an “overvoltage” inconsistent with normal operation of the circuit according to Nagakubo is provided to the driving section of the circuit the Peltier element might provide excessive heat to the laser module causing damage to sensitive components of the laser module. In this way, the prior art of Nagakubo does not act to suppress either of an overcurrent flowing into the thermo-module (referred to as a Peltier element in Nagakubo) or an overvoltage across the thermo-module.

In contrast, the use of , for example, a Zener diode caps the current flowing o the peltier element by diverting excess current (and capping the voltage across the Zener diode simultaneously) to another current flow path. The circuit of prior art of Nagakubo requires said current to traverse the circuit and thereby to affect the overall circuit performance by resulting in an overvoltage situation or by damaging circuit components.

The limiting resistors of Nagakubo are described as such because they vary in resistance in response to variations in temperature. These resistors do not act to limit current

flow directly or in a fashion similar to the Zener diode of the exemplary embodiment of the present invention.

Claims 12-15, 28, 33 and 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's patent JP 11-310992 (application number).

As discussed during the telephone interview of June 15, 2004, JP 11-310992 is an unexamined patent application, and no exclusionary rights had been awarded to the applicant as of the filing date of the instant application. In fact, patent number P3469833, which is based on unexamined patent application number JP 11-310992, was not registered until September 5, 2003, well after the June 20, 2001 filing date of the instant application. Accordingly, Applicant submits that JP 11-310992 is not properly citable under 35 U.S.C. 102(e) against the instant application.

Applicant respectfully submits that claims 12-15, 28, 33 and 34 are in proper condition for allowance. Favorable reconsideration is kindly requested.

### **Double Patenting**

Claims 1-3, 5-7, 9-11, 16-27, 29-32, 35, and 36 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-16 of prior U.S. Patent No. 6,385,222 B1. This is a double patenting rejection.

Applicant respectfully submits that claims 1-3, 5-7, 9-11, 16-27, 29-32, 35, and 36 do not claim the same invention as that of claims 1-16 of prior U.S. Patent No. 6,385,222 B1. For instance, claim 1 of the instant application could be literally infringed without literally infringing a corresponding claim in the reference patent (6,385,222). In particular, a device according to claim 1 of the instant application having only an overvoltage limiting circuit but not an overcurrent limiting circuit would literally infringe claim 1 of the instant application but would not literally infringe any claim of the reference patent (6,385,222). Dependent claims 2-3 and 5-7, 9-11, 16-24 include all of the limitations of independent claim 1, and accordingly define embodiments of the invention that do not fall within the scope of any claim in the reference patent (6,385,222).

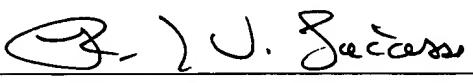
Claim 25 of the instant application could be literally infringed without literally infringing either one of claims 15 or 16 in the reference patent (6,385,222). In particular, performing a method including a step of suppressing an overcurrent flow to the thermo-module by providing an overcurrent limiting circuit that is connected **in any way other than parallel** to the thermo-module could literally infringe claim 25 of the instant application without literally infringing claim 15 in the reference patent (6,385,222). Furthermore, claim 25 recites a step of “suppressing some of an overcurrent flowing into the thermo-module by providing an overcurrent flow limiting circuit for the thermo-module,” and at page 13, lines 7-12 of the instant application it is stated “the overcurrent limiting means is not limited to an overcurrent limiting circuit 20 consisting of a bypass line 21, a resistor 22, and a diode 23 as illustrated in Fig. 3, but it can be achieved by other circuit means having similar functions or a software implementation.” Accordingly, claim 25 of the instant application could be literally infringed without infringing claim 16 of the reference patent, since claim 16 of the reference patent requires a step of “causing a resistor to intervene in said bypass path” in order to be literally infringed. Dependent claims 26-32, 35, and 36 include all of the limitations of independent claim 25, and accordingly define embodiments of the invention that do not fall within the scope of any claim in the reference patent (6,385,222).

Applicant respectfully submits that no new matter has been added to the application.

**Please charge \$86.00 for the payment of one additional independent claim in excess of 3 and \$72.00 for the payment of four additional claims in excess of 20 to Deposit Account No. 50-1142.**

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Respectfully,

  
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